

DEPENDENT PLURALS AND DISTRIBUTIVITY*

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It is argued in this paper that the theory of distributivity proposed in Choe (1987) can be extended to cover the cases of distributivity involving dependent plurals. The singular reading of bare plurals, it is claimed, is available to the distributivity dependency proposed and motivated in Choe (1987).

0. Introduction

Dependent Plurals refer to “a use of bare plurals in which their meaning seems to be the same as that a singular indefinite would have in certain related sentences (Barbara H. Partee, class notes).” Consider the following sentence that is originally from Chomsky (1975) :

- (1) Unicycles have wheels.

One of the readings of (1) corresponds to the distributive reading of the following :

- (2) Unicycles have a wheel.

The two sentences (1) and (2) can be synonymous : the same distributivity is involved in both sentences, which is illustrated in (3).

- (3) unicycle₁ ... wheel₁
unicycle₂ ... wheel₂
.....
unicycle_n ... wheel_n

De Mey (1981) calls the reading of (1) in which the plural must be taken in what is apparently a singular meaning the ‘dependent reading.’ *Wheels* in (1), which acts like *a wheel* in (2), is a dependent plural.¹

* This paper is a slightly expanded version of my dissertation (Choe 1987).

¹ Dependent plurals are not restricted to noun phrases, as is shown by the following examples.

- (1) a. From here, trains leave regularly for Amsterdam.

A fundamental question one might ask concerning Dependent Plurals is : Where does their singular reading come from? One extreme view may claim that the plural noun *wheels* in (1) is ambiguous between its plural reading and singular reading, but then the same theory cannot explain why bare plurals usually have only the plural reading.

(4) I have wheels.

If *wheels* is ambiguous between *wheels* and *a wheel*, (4) should be synonymous with the following sentence.

(5) I have a wheel.

However, the situations that are described by (4) and (5) are exclusive to each other. Given a certain situation, it cannot be the case that both (4) and (5) are true with respect to that situation—either one has to be false.

On the other hand, another extreme view may claim that the singular reading of bare plurals comes from the context. There are two subsequent questions that arise out of this view. One is if the bare plural in question, i.e. *wheels* in (1), has any meaning at all with respect to its number. The other is how the context derives the singular reading from the apparently plural noun. In this paper, I will argue that bare plurals in English are ambiguous, but one of its readings, namely, the singular reading, is only sensitive to a certain aspect or aspects of grammar. It is claimed that one of those aspects is distributivity.

1. A Theory of Distributivity

In Choe (1987), I have proposed a theory of distributivity, which can be

(De Mey 1981)

b. John often wears loud neckties. (Roberts 1987; originally attributed to B. H. Partee)

c. Jane gave the girls nickels. (Partee 1975)

d. German civil defense workers spotted two of our planes.
(Roberts 1987)

(1a) can mean a train leaves at regular intervals, that is, one at 10 o'clock, another at 11 o'clock, and yet another at 12 o'clock. (1b) also has the same distributivity reading, given the pragmatic knowledge that people wear neckties one at a time. The other two examples show that dependent plurals may appear as a direct object as in (1d), or as a subject as in (1d).

De Mey (1981) and Roberts (1987) argue that pronouns may act like dependent plurals.

(2) All the boys have brought their fathers along.

(De Mey 1981)

summarized as follows.

- (6) Distributivity dependency is a relation between two arguments in a clause.

Consider the following sentence.

- (7) Each unicycle has a wheel.

(7) shows the same kind of distributivity as was illustrated in (3), which is repeated here.

- (8) unicycle₁ ... wheel₁
 unicycle₂ ... wheel₂

 unicycle_n ... wheel_n

In Choe (1987), I called the argument which acts as a key for the distributivity Sorting Key (=SrtKy) and the other argument that is being distributed Distributed Share (=DstrShr). I argued that the apparent plural meaning of *a wheel* in (7) is a result of the distributivity dependency projected.

I will not go into the details of the proposal, but it essentially captures the distributivity reading in the following sentences as one and the same kind. In other words, their distributivity reading is a result of the same set of principles.

- (9) a. Every child is wearing a red hat.
 b. Each child is wearing a red hat.
 c. The children were wearing a red hat each.
 d. The children were wearing a red hat.

In each of the above sentences, the subject is the SrtKy and the object *a red hat* (*each*) the DstrShr. One requirement on SrtKy is that it be semantically plural, and the subject noun phrases in (9) meet this requirement. Projection of distributivity dependency is optional, unless marked otherwise. I claimed that determiner *each* as in (9b) is the SrtKy marker, and that the postnominal *each* as in (9c) is the DstrShr marker. In both cases, distributivity dependency is obligatorily projected. Notice that (9b) and (9c) are not ambiguous and only allows the distributivity reading.

Now, distributivity involving dependent plurals raises an interesting problem to us: What are SrtKy and DstrShr in (1)?

2. Dependent Plurals and Distributivity

In order to answer the question, let us first compare the two sentences in (1) and (2). While it is possible to project a distributive dependency in (2), it gives

a wrong result if we project one in (1), since the resulting distributivity would mean that "for each of the unicycles, there are wheels." Thus, let us tentatively introduce the following :

- (10) The singular reading of the bare plural is available for distributive dependency (as DstrShr).

Two kinds of questions may arise concerning (10). One is about the validity of (10) : Is there any independent motivation for (10)? The other question would be : Does it work? We will consider the second question first, and deal with the first issue in the next section.

Once it is allowed to take the singular meaning of a bare plural as DstrShr, then the synonymy of (1) and (2) would follow naturally in our analysis. The following sentence does not allow the same kind of distributivity, since *a unicycle* is not semantically plural.

- (11) # A unicycle has wheels.

That explains why (11) is not good ; the reading available for (11) is only the group reading, and that reading sound infelicitous according to the lexical contents of the words involved. A cycle with more than one wheel, by definition, cannot be a unicycle.

But (11) raises a problem to our hypothesis. Can't we take *wheels* as SrtKy and *a unicycle* as DstrShr in (11)? If so, we should allow the distributive reading as in (2). I would claim that in principle we should allow that distributivity. But there are some (secondary) factors that may affect the projectability of distributive dependency. One of them is pragmatics.² I argue that *Dstr (wheels, a unicycle)* can be allowed in principle but is blocked by the contents of the lexical items involved.

The above claim predicts that with appropriate lexical items, the distributivity in question might hold in constructions like (11). The following sentence upholds the prediction :

- (12) A Goodyear wheel fits on unicycles.

Given our world knowledge about unicycles and wheels, (12) cannot have the group reading as (11) could not. But (12) is O. K. Notice that in (12), we get the distributive reading between *unicycles* and *a Goodyear wheel*.

It seems that the pragmatic factor that blocks the distributive reading has something to do with the possessor...possessed relation between *a unicycle* and *a wheel*. (13a) seems more 'natural' than (13b) given our knowledge between *a unicycle* and *a wheel*.

² Other secondary factors are c-command relations and grammatical functions (subjects, objects, etc.).

- (13) a. a wheel per unicycle
 b. a unicycle per wheel

Moreover, the verb is *have* in (11)—a verb that defines the possession relation between *a unicycle* and *a wheel*.

- (14) a. a unicycle and its wheel
 b. # a wheel and its unicycle

Notice also that forcing a distributive reading with an appropriate morphological marker would not enhance the grammaticality of (11).

- (15) # A unicycle has each wheel.

What (15) shows is that the implausibility of distributivity dependency between *wheels* and *a unicycle* in (11) is not because of some particular property of the bare plural *wheels* but because of some other (pragmatic) factor(s).

Once we establish that dependent plurals function as (a special type of) DstrShr, it comes as no surprise that they show certain characteristics that DstrShr would have. The following two properties of dependent plurals are from De Mey (1981 : 60) :

- (16) a. A dependent plural must have a plural expression as its antecedent.
 b. Adverbial of time can function as antecedent.

(16a) is a condition for SrtKy. (16b) is a result of allowing an event argument as SrtKy. In Choe (1987), it was argued that an event argument, which is a combination of time and place, can function as a Strky. One of De Mey's examples that illustrate (16b) comes from Dutch :

- (17) Hij draagt altijd nette pakken
 'He always wears decent suits.'

hij 'he' is not plural, but there is an alternative antecedent *altijd* 'always' for the dependent reading of *nette pakken* 'decent suits.' The following sentence, again from De Mey, shows essentially the same point.

- (18) A unicycle always has oval wheels.

(18) is identical to the infelicitous (11) except for the adverb *always*. De Mey argues that sentence (18) can be felicitous in a situation where the shape of the unicycles is in constant change. (18) is a case where the i-part³ of the bare plural *oval wheels* is multiplied under the 'event' argument that is represented by the adverbial expression *always*.

³ The term "i-part" is from Link (1985), and roughly corresponds to the concept "is a member of."

Another property of dependent plural discussed by De Mey is *c-command* restriction. This property, if valid, obviously poses a problem to Choe (1987) since it was claimed there chapters that morphologically marked *DstrShr*'s do not observe strict *c-command* restriction. De Mey's evidence for the *c-command* restriction is based on the unacceptability of the sentence in (11). We have seen that there is another explanation to it. I also have shown in (12) that *c-command* relation is not crucial to distributivity. The dependent plural version of (12) in the following does have the reading in which it is synonymous with (12).

(19) Goodyear tires fit on unicycles.

Therefore, it seems not conclusive whether distributive dependency involving dependent plurals should observe a strict structural constraint or not.

3. I-part Operation on Dependent Plurals

The question we will consider in this section with respect to our earlier assumption in (10) is this: How is the singular counterpart of a bare plural available for distributive dependency? I will propose that it is the *i-part* operation that makes it happen. *I-part* operation, applied on a bare plural, will give a "semi-lattice."⁴ And the singular reading of the bare plural is available for some grammatical process as a result of the *i-part* operation.

Then the next question, a more serious one, is: What motivates the *i-part* operation on (English) bare plurals? I will provide a weak answer to this question: Our world knowledge triggers the *i-part* operation. I do not have any clear argument for this proposal: somehow the assumption we had in (10) works fine and it explains the 'structural' properties of dependent plural very well (cf. (16)). However, there are two observations I would like to make concerning my answer.

One is from De Mey (1981) and Roberts (1987). A dependent plural reading, in many cases, is "obligatory, possible, or forbidden for idiomatic reasons (Roberts, p. 240)." So pragmatic factors are important in the interpretation of dependent plurals.

The other observation has to do with other phenomena that are closely related to dependent plurals. Consider the following.

(20) Automobiles have headlights.

We know that an automobile normally has a pair of headlights at its front end. That is, (20) is synonymous with (21).

⁴ The term "semi-lattice" is also from Link (1985).

(21) Automobiles have two headlights.

Headlights in (20) is not a dependent plural, according to the definition given above, since it is not synonymous with *a headlight*. But the relation between (1) and (2) and that between (20) and (21) apparently are the same except that the units being distributed are different from each other because of our world knowledge or lexical knowledge about automobiles and unicycles. In our terms, the unit of DstrShr is determined by our world knowledge and the lexical information we have.

(22) automobile₁ ... headlight_{1a,1b}
 automobile₂ ... headlight_{2a,2b}

 automobile_n ... headlight_{na,nb}

If our knowledge is not clear, we will also have difficulty in deciding whether a bare plural is a dependent plural or not. Consider the following.

(23) Martians have eyes.

To those who believe Martians have one eye right above their nose, the bare plural *eyes* in (23) is a dependent plural. To others who believe Martians appearance is just like that of human beings, the same bare plural would not be classified as a dependent plural, since it would be synonymous to *two eyes* rather than *an eye*. Yet to others who are not sure of that at all, the bare plural is either a dependent plural or not. The point is that whether a bare plural in a certain context is a dependent plural or not is totally dependent on our world knowledge, which is probably mediated by the lexical items. (24) provides some more related examples.

- (24) a. Unicorns have horns.
 b. Automobiles have headlights.
 c. Dogs have legs.
 d. People share apartments.
 e. Birds build nests.

REFERENCES

- Choe, J. (1987) *Anti-quantifiers and a Theory of Distributivity*, Ph.D. dissertation, University of Massachusetts, Amherst.
 Chomsky, N. (1975) 'Questions of Form and Interpretation,' in R. Austerlitz,

- ed., *The Scope of American Linguistics*, Lisse: Pater de Ridder.
- De Mey, S. (1981) 'The Dependent Plural and the Analysis of Tense,' in V.A. Burke & J. Pustejovsky, eds., *Proceedings of NELS 11* (pp. 58-78), GLSA, University of Massachusetts, Amherst.
- Link, G. (1985) 'Generalized Quantifiers and Plurals,' ms, University of Munich and CSLI, Stanford.
- Partee, B. (1975) 'Comments on Fillmore's and Chomsky's Papers,' in R. Austerlitz, ed., *The Scope of American Linguistics*, Lisse: Pater de Ridder.
- Roberts, C. (1987) *Modal Subordination, Anaphora, and Distributivity*, Ph.D. dissertation, University of Massachusetts, Amherst.

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